AMENDMENTS TO THE CLAIMS

The present listing of claims replaces all prior versions and listings of claims in the subject patent application:

Claim 1 (currently amended): A method for tracking a plurality of objects, comprising:

repeatedly scanning a region containing a set consisting of one or more moving objects and generating N sequential images or data sets of said region, a plurality of observations in said images or data sets providing positional information for objects in said set;

determining a plurality of tracks, at least one track for each object in said set;

determining a plurality of costs, wherein each cost is for assigning one of said observations to one of said tracks;

defining a linear programming problem:

$$\text{Minimize} \quad \sum_{i_1 \cdots i_N} c_{i_1 \cdots i_N} z_{i_1 \cdots i_N}$$

$$\text{Subject To} \quad \sum_{i_2 i_3 \cdots i_N} z_{i_1 \cdots i_N} = 1 \quad (i_1 = 1, \ldots, M_1)$$

$$\sum_{i_1 i_3 \cdots i_N} z_{i_1 \cdots i_N} = 1 \quad (i_2 = 1, \ldots, M_2)$$

$$\sum_{i_1 \cdots i_{p-1} i_{p+1} \cdots i_N} z_{i_1 \cdots i_N} = 1$$

$$(i_p = 1, \ldots, M_p \text{ and } p = 2, \ldots N-1)$$

$$\sum_{i_1 i_2 \cdots i_{N-1}} z_{i_1 \cdots i_N} = 1 \quad (i_N = 1, \ldots, M_N)$$

$$0 \le z_{i_1 \ldots i_N} \le 1 \text{ for all } i_1, \ldots, i_N,$$

wherein each $c_{i1 \ldots iN}$ is included in said plurality of costs, each M_i, i=1,...,N, being one of: (a) a number of observations in an i^{th} image or data set of said *N*

sequential images or data sets; (b) a sum of a number of tracks in said plurality of tracks, and a number of said observations in the i^{th} image or data set not assigned to one of said tracks; and (c) a number of tracks in said plurality of tracks;

solving said linear programming problem for values of $z_{i1\ldots iN}$ for each $i_1 \ldots i_N$;

determining a value $z_{i1\ldots iN}$ in {0,1} for each $i_1 \ldots i_N$ corresponding to each $z_{i1\ldots iN}$, wherein said values $z_{i1\ldots iN}$ provide an optimal or near optimal solution to said linear programming problem; and

taking one or more of the following actions based on said optimal or near-optimal assignment of said plurality of points to said plurality of tracks:

sending a warning to aircraft or a ground or sea facility,

controlling air traffic,

controlling anti-aircraft or anti-missile equipment,

taking evasive action,

working on one of said one or more objects, and

surveilling one of said one or more objects.

Claim 2 (new): A method for tracking a plurality of objects, comprising:

using remote scanning apparatus to repeatedly scan a region containing a set consisting of one or more moving objects and generating N sequential images or data sets of said region, a plurality of observations in said images or data sets providing positional information for objects in said set;

using a computer system to determine a plurality of tracks, at least one track for each object in said set;

using a computer system to determine a plurality of costs, wherein each cost is for assigning one of said observations to one of said tracks;

defining a linear programming problem:

$$\text{Minimize} \quad \sum_{i_1 \cdots i_N} c_{i_1 \cdots i_N} z_{i_1 \cdots i_N}$$

$$\text{Subject To} \quad \sum_{i_2 i_3 \cdots i_N} z_{i_1 \cdots i_N} = 1 \quad (i_1 = 1, \ldots, M_1)$$

$$\sum_{i_1 i_3 \cdots i_N} z_{i_1 \cdots i_N} = 1 \quad (i_2 = 1, \ldots, M_2)$$

$$\sum_{i_1 \cdots i_{p-1} i_{p+1} \cdots i_N} z_{i_1 \cdots i_N} = 1$$

$$(i_p = 1, \ldots, M_p \text{ and } p = 2, \ldots N-1)$$

$$\sum_{i_1 i_2 \cdots i_{N-1}} z_{i_1 \cdots i_N} = 1 \quad (i_N = 1, \ldots, M_N)$$

$$0 \le z_{i_1 \ldots i_N} \le 1 \text{ for all } i_1, \ldots, i_N,$$

wherein each $c_{i1 \ldots iN}$ is included in said plurality of costs, each M_i, i=1,...,N, being one of: (a) a number of observations in an i^{th} image or data set of said *N* sequential images or data sets; (b) a sum of a number of tracks in said plurality of tracks, and a number of said observations in the i^{th} image or data set not assigned to one of said tracks; and (c) a number of tracks in said plurality of tracks;

using a computer system for solving said linear programming problem for values of $z_{i1 \ldots iN}$ for each $i_1 \ldots i_N$;

using a computer system for determining a value $z_{i1 \ldots iN}$ in {0,1} for each $i_1 \ldots i_N$ corresponding to each $z_{i1 \ldots iN}$, wherein said values $z_{i1 \ldots iN}$ provide an optimal or near optimal solution to said linear programming problem; and

using a computer system to determine which one or more of the following actions will be taken based on said optimal or near-optimal assignment of said plurality of points to said plurality of tracks:

sending a warning to aircraft or a ground or sea facility,

controlling air traffic,

controlling anti-aircraft or anti-missile equipment,

taking evasive action,

working on one of said one or more objects, and

surveilling one of said one or more objects.

Claim 3 (new): The method of claim 2, wherein the remote scanning apparatus for repeatedly scanning a region containing a set consisting of one or more moving objects comprises radar apparatus.